in the complete solution and dissolution of the cell. Photogenin is a colloid and I would suggest that these substances have a similar action on the colloidal particles of photogenin. We are not dealing here with a cytolysis of cell fragments present in the secretion, since these cytolytic agents (salts, thymol, etc.) cause light production even in solutions of photogenin filtered through porcelain or siliceous filters which remove all granules and cell fragments. I would suggest, therefore, as a working hypothesis rather than a formal theory, that photophelein acts by changing the aggregation state of the colloidal particles of photogenin toward that of greater dispersion, thus increasing the surface of the particles. It is known that oxidation occurs at the surface of many colloidal particles, and light production might easily result from auto-oxidation accompanying the dispersion of the colloidal particles.

Photopheleins from different species of animals have different chemical properties and, like the cytolysins, they are also specific to a considerable degree. Firefly photophelein will produce light on mixing with photogenin of other insects (*Pyrophorus*), but none or very faint light on mixing with photogenin from *Cypridina*. A non-luminous species of *Cypridina* contains a photophelein with marked light-producing action on the photogenin of the luminous *Cypridina*, but none with firefly photogenin. Photophelein, therefore, is to be compared with the specific cytolytic substances of blood sera, with this exception, that it is the photophelein of the same species which has the greatest light producing action whereas the blood of the foreign species is the one possessing the greatest cytolytic (hemolytic) power.

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INOCULATIONS ON RIBES WITH CRONARTIUM RIBICOLA FISCHER[1]

THE white pine blister rust is established in the native white pine growth of many parts of New England. Since, in most sections of New England, the pine far outvalues the cultivated currants and gooseberries, the latter, together with the wild *Ribes,* are being removed to hold the disease under control. A cultivated currant or gooseberry, not susceptible to the disease and possessing commercial qualities, would be of much practical importance for future planting within the diseased area. Even a wild species of *Ribes* immune to the disease might be of value for breeding new resistant commercial varieties to replace those now being removed. For the purpose of discovering such resistant varieties or species of *Ribes,* inoculations under controlled conditions have been made during the past three years on 82 varieties of cultivated red, black and white currants, 23 varieties of cultivated gooseberries, and 48 species and hybrids of *Ribes* from various parts of the world. Field tests are also being made with many of the above varieties and species.

The varieties of a cultivated species show considerable variation in the degree of their susceptibility to the disease. The cultivated species of *Ribes* also vary decidedly in susceptibility. Some varieties and some species, notably *Ribes nigrum,* are very congenial hosts for the rust, very abundant uredinia and telia being produced thereon. In other varieties and species the rust spreads rapidly over the leaf surface and produces abundant uredinia, but the leaf tissue often dies before many telia are formed. In other cases a few uredinia form, at which time irregular areas of the leaf tissue die quickly, with or without further spread of the fungus around the dead area. Sometimes, instead of a definite area being killed, small streaks or flecks are killed. These dead spots often enlarge slowly, producing occasionally a few uredinia or telia. All intergradations are found between *R. nigrum,* upon which the maximum number of fruiting bodies form, and *R. leptanthum,* on which small dead areas and flecks are formed, on less than 10 per cent. of which rust spores are produced. The vigor of the plant and the age of the leaves have an influence on the development of the disease. The

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size of the leaves has little influence, if they are relatively old, those less than one tenth normal size having taken the disease in a manner characteristic for the host species.

In many cases inoculations have been made with æciospores as well as with uredospores, similar results being obtained upon the same host. In most cases both uredinia and telia were produced. It has been impossible thus far to have all the species authoritatively identified, that being done as fast as the development of the plants will permit. Therefore this list is subject to such changes as further study of the plants may cause. The synonymy of the group is based, for the North American species, on Coville's treatment in "North American Flora," issued by the New York Botanical Garden, and for the species of the rest of the world on Janczewski's "Monographie des Grosseilliers, *Ribes* L." and supplements to that work.

Successful inoculations have been made upon the following species: *Ribes alpestre* Dec., *R. alpinum* L., *R. americanum* Mill., *R. aureum* Pursh, *R. bracteosum* Douglas, *R. carrierei* hybrid, *R. cereum* Douglas, *R. coloradense* Coville, *R. cruentum* Greene, *R. culverwellii* hybrid, *R. curvatum* Small, *R. cynosbati* L., *R. diacantha* Pallas, *R. divaricatum* Douglas, *R. erythrocarpum* Coville & Leiberg, *R. fasciculatum* Seib. & Zucc., *R. fontenayense* hybrid, *R. futurum* hybrid, *R. giraldii* Janczewski, *R. glandulosum* Grauer, *R. glutinosum* Bentham, *R. gordonianum* hybrid, *R. hesperium* McClatchie, *R. hirtellum* Michaux, *R. holosericeum* hybrid, *R. inebrians* Lindley, *R. inerme* Rydberg, *R. irriguum* Douglas, *R. lacustre* (Persoon) Poir., *R. leptanthum* Gray, *R. lobbii,* Gray, *R. menziesii* Pursh, *R. missouriense* Nuttall, *R. montigenum* McClatchie, *R. nevadense* Kellogg, *R. nigrum* L., *R. nigrum* var. *aconitifolium, R. odoratum* Wendl., *R. oxyacanthoides* L., *R. petraeum* Wulf., *R. reclinatum* L., *R. rotundifolium* Michaux, *R. sanguineum* Pursh, *R. setosum* Lindley, *R. speciosum* Pursh, *R. succirubrum* hybrid, *R. triste* Pallas, *R. viscosissimum* Pursh, *R. vulgare* Lam.

Successful inoculations have been made on numerous unidentified *Ribes* from all parts of the United States, including over one hundred collections made by R. K. Beattie in the Northwest and Pacific Coast States. Thus far no species has proved to be entirely resistant to the rust.

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THE AMERICAN PHILOSOPHICAL SOCIETY. II

Naming American hybrid oaks: WILLIAM TRELEASE, Sc.D., LL.D., professor of botany, University of Illinois, Urbana.

Thirty-eight known or probable hybrids among the oaks of the United States have been brought together from various and much scattered publications. No cases are believed to exist in which a species of the white oak group (*Leucobalanus*) has intercrossed with a species of the red oak group (*Erythrobalanus*). To the 38 accepted hybrids already recorded, two are added in this paper—× *Quercus palæolithicola* (a cross between *Q. ellipsoidalis* and *Q. velutina*), and *Q. Schuettei* (a cross between *Q. bicolor* and *Q. macrocarpa*). Of the 40 recognized hybrids, 15 have been given binomials by earlier writers: the remaining 25 are here named for the first time, in accordance with international rules of procedure.

The wild relatives of our cultivated plants and their possible utilization: W. T. SWINGLE, Ph.D., U. S. Department of Agriculture. (Introduced by Dr. William P. Wilson.)

An annotated translation of de Schweinitz's two papers on the rusts of North America: JOSEPH C. ARTHUR, professor emeritus of botany, Purdue University, Lafayette, Indiana, and G. R. BISBY. (Introduced by Professor John M. Coulter.)